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(19) (CA) **CANADIAN PATENT** (12)

(54) 4-CYCLOHEXYL-4-METHYL-2-PENTANONE
AS DEODORANTS

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MALODOR COUNTERACTANTS

Abstract of the Disclosure

Compositions and methods for counteracting malodors.

4-cyclohexyl-4-methyl-2-pentanone has been found to be particularly useful in such compositions and methods.

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MALODOR COUNTERACTANTS

Cross-References to Related Applications

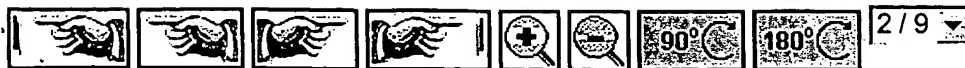
None.

Field of the Invention

This invention relates to the art of treatment of offensive odors, more particularly, to compositions and methods to counteract certain malodors.

Description of the Prior Art

The art of perfumery began, perhaps, in the ancient cave dwellings of prehistoric man. From its inception, and until comparatively recently, the perfumer has utilized natural perfume chemicals of animal and vegetable origin. Thus, natural perfume chemicals such as the essential oils, for example, oil of rose and oil of cloves, and animal secretions such as musk, have been manipulated by the perfumer to achieve a variety of fragrances. In more recent years, however, research perfume chemists have developed a large number of synthetic odoriferous chemicals possessing aroma characteristics particularly desired in the art. These synthetic aroma chemicals have added a new dimension to the ancient art of the perfumer, since the compounds prepared are usually of a stable chemical nature, are inexpensive as compared with the natural perfume chemicals and lend themselves more easily to manipulation than the natural perfume chemicals since such natural perfume chemicals are usually a complex mixture of substances which defy chemical analysis. In contrast thereto, the synthetic aroma chemicals possess a known chemical structure and may therefore be manipulated by the perfumer to suit specific needs. Such needs vary over a very wide spectrum. Accordingly, there is a great need in the art of fragrance compositions for compounds possessing specific olfactory characteristics.



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10 In general these products provide a masking effect by one of two mechanisms. The maskant fragrance is provided either to suppress the offensive odor by providing a more pleasing aroma in large quantities or by providing an aroma that blends with the offensive odor to provide a different and more desirable aroma. Unfortunately, in both instances a large amount of fragrance must be utilized which in itself often proves to be offensive. Furthermore, the offensive odor is usually still detectable at the levels of maskant fragrances that are reasonably tolerable. Accordingly, compositions and methods for counteracting such offensive odors which would substantially eliminate such odors without the above noted disadvantages are particularly desirable.

Summary of the Invention

The instant substance which exhibits this surprising

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ability to counteract malodors is 4-cyclohexyl-4-methyl-2-pentanone (hereinafter referred to as "CMP").

Description of the Preferred Embodiments

The term "counteract" as used herein means the effect on the human sense of smell and/or the malodor resulting in alleviating the offensiveness of the malodor to the human sense of smell. It is not intended that this term be limited to any particular mechanism by which such a result may be obtained.

Surprisingly CMP is capable of effectively counteracting malodors when utilized in small quantities. CMP can be used in many different mediums to counteract malodors. For instance, use in room fresheners or deodorants in the form of aerosols (sprays, etc.), liquids (wick type), solids (wax bases as in pomander, plastics, etc.), powders (sachets, dry sprays) and gels (solid gel sticks) are particularly preferred. Other illustrative uses are in clothes deodorants as applied by washing machine applications such as in detergents, powders, liquids, whiteners or fabric softeners or by other applications such as closet blocks, closet aerosol sprays, or clothes storage areas or in dry cleaning to overcome residual solvent notes on clothes; in cleansers such as disinfectants and toilet bowl cleaners; in bathroom accessories such as paper towels, bathroom tissues, sanitary napkins, towel-lets, disposable wash cloths, disposable diapers, and diaper pail deodorants; in cosmetic products such as antiperspirant and under-arm deodorants, general body deodorants in the form of powders, aerosols, liquids or solid, or hair care products such as hair sprays, conditioners, rinses, hair colors and dyes, permanent waves, depilatories, hair straighteners, hair groom applications such as pomade, creams, lotions, etc., medicated hair care products containing such ingredients as S-Selenium-sulfide, coal tar, salicylates, etc., or shampoos, or foot care products such as

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or soaps and synthetic detergents such as bars, liquids, foams, or powders; in odor control such as during manufacturing processes, such as in the textile finishing industry and the printing industry (inks and paper); in effluent control such as in processes involved in pulping, stock yard and meat processing, sewage treatment, or garbage disposal, or in product odor control as in textile finished goods, rubber finished goods, car fresheners, etc.; in agricultural and pet care products such as dog and hen house effluents, and domestic animal and pet care products such as deodorants, shampoo or cleaning agents, or animal litter materials; in large scale closed air systems such as auditoriums, and subways and transport systems.

The amount of CMP to be utilized depends, in general, on the particular malodor involved and its concentration and on other variables such as the medium in which it is used and the temperature, humidity and air circulation. An effective amount should be used. In general, CMP is effective when present in the air (in which the malodor is located) at a level as low as about 0.01 mg./cubic meter of air. Any concentration above this amount will generally be effective. However, from a practical point of view, more than about 1 mg./cubic meter of air is probably unnecessary with even the most offensive and concentrated malodors.

CMP can be prepared by reacting benzene with mesityl oxide to form 4-methyl-4-phenyl-2-pentanone which is then subjected to appropriate hydrogenation.

The following examples are given to illustrate the instant invention in detail. It is to be understood that the specific details given in the examples are not to be construed as limiting the scope of the invention. The symbol "mg./cu. meter" refers to the weight (in milligrams) of material present in one cubic meter of air.

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Example 1

The following malodor concentrates were prepared:

Burned Tobacco Malodor Concentrate

	<u>Component</u>	<u>Parts by Wt.</u>
	furfural	5.0
	pyridine	0.1
	methyl ethyl pyridine	12.6
	95% aqueous solution of thioglycolic acid	0.7
	Beechwood cresote	1.2
10	pyroligneous acid	30.6
	dipropylene glycol	49.8

Body Malodor Concentrate

	<u>Component</u>	<u>Parts by Wt.</u>
	n-caproic acid	30.00
	isovaleraldehyde	30.00
	phenylacetic acid	3.00
	butyric acid	0.25
	indole (0.5% solution in dipropylene glycol)	1.50
	para-cresyl isovalerate	1.50
20	para-cresyl phenyl acetate	2.75
	85% aqueous solution of thioglycolic acid	5.00
	dipropylene glycol	26.00

Bathroom Malodor Concentrate

	<u>Component</u>	<u>Parts by Wt.</u>
	skatole	0.91
	β -thionaphthol	0.91
	85% aqueous solution of thioglycolic acid	21.18
	n-caproic acid	6.00
	p-cresyl isovalerate	2.18
30	N-methyl morpholine	6.00
	dipropylene glycol	62.82

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Aerosol cans were prepared with each of the above malodors with the following concentrations:

Burned Tobacco Malodor Aerosol

<u>Component</u>	<u>Parts by Wt.</u>
Burned Tobacco Malodor Concentrate	0.2
dipropylene glycol	4.8
Fluorocarbon* propellant -F 11/12 (50/50)	95.0

Body Malodor Aerosol

<u>Component</u>	<u>Parts by Wt.</u>
10 Body Malodor Concentrate	0.1
dipropylene glycol	4.9
Fluorocarbon* propellant -F 11/12 (50/50)	95.0

Bathroom Malodor Aerosol

<u>Component</u>	<u>Parts by Wt.</u>
Bathroom Malodor Concentrate	0.1
dipylene glycol	4.9
Fluorocarbon* propellant -F 11/12 (50/50)	95.0

Four fragrance compositions were prepared, each containing 10% by weight of CMP. These are identified, based on the

20 fragrance effect, as:

Fragrance

Floral bouquet
Cologne spice
Lavender bouquet
Ozone type

Aerosol cans were prepared with each of the above fragrance compositions with the fragrance composition being present in a concentration of 0.5% with fluorocarbon* propellant -F 11/12 (50/50) constituting the remaining material in the system.

30 A test chamber having inside dimensions of 3.35 x 3.65 x 2.44 meters with a total volume of 29.9 cubic meters, having an access door

*The product marketed under the trade mark "FREON"

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and an exhaust fan was provided. The capacity of the exhaust fan was 14 cu. meters/min. order to insure satisfactory evacuation the exhaust fan was operated for five minutes between tests and an olfactory check was made to determine if any residual odor could be detected prior to conducting the next test.

After the test chamber had been suitably evacuated the malodor to be utilized was sprayed from the aerosol can for about five seconds. After a delay of from 10-15 seconds the fragrance composition aerosol was sprayed for about five seconds (five seconds being an average time such an aerosol would usually be used by a housewife). One minute thereafter a 10 member panel (consisting of 7 persons skilled in perfumery and odor evaluation and 3 persons having no such special skills but being familiar with fragrances in general) entered the test chamber, performed an olfactory evaluation for detection of the malodor and recorded their observations. All tests were performed with only one (1) member of the panel being aware of the identity of the material being tested.

Based on flow rates through the valves utilized in the aerosol cans the approximate amounts of aerosol containing the malodor concentrate introduced into the test chamber are:

<u>Aerosol Containing Malodor Concentrate</u>	<u>Amount (mg./cu. meter)</u>
Burned Tobacco	267
Body	166
Bathroom	267

The amount of aerosol containing the fragrance compositions introduced into the test chamber is approximately 260 mg./cu. meter.

When the above described test procedure was carried out using each of the fragrance composition aerosols containing CMP

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(tested against each of the three above-mentioned malodors) at least eight (8) members of the panel could not detect the presence of the malodors. These are particularly surprising results because when the floral bouquet fragrance composition aerosol not containing CMP is tested at least six (6) members of the panel detected the presence of the malodors.

Example 2

Four well known commercial products were also utilized in the above-described test procedures against each of the above-
10 described malodors. (Amounts utilized based on 5 second spray):

<u>Commercial Product</u>	<u>Amount (mg./cu. meter)</u>
A	152
B	170
C	150
D	68

With all of these commercial products at least six (6) members of the panel detected the presence of the malodors.

Example 3

20 An aerosol can was prepared with the following concentrations:

<u>Component</u>	<u>Parts by Wt.</u>
CMP	0.05
Fluorocarbon * propellant -F 11/12 (50/50)	99.95

The aerosol was utilized in the above-described test procedures against each of the above-described malodors (aerosol 267 mg./cu. meter). At least eight (8) members of the panel could not detect the presence of the malodors.

This ability of CMP to counteract malodors is particularly
30 surprising in view of the fact that a closely related compound 4-cyclohexyl-3-methyl-2-pentanone, has little or no such ability.

*(The product marketed under the trade mark "FREON")



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While the invention has been described herein with regard to certain specific embodiments, it is not so limited. It is to be understood that variations and modifications thereof may be made by those skilled in the art without departing from the spirit and scope of the invention.



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The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A composition to be used to counteract malodors comprising an effective amount of 4-cyclohexyl-4-methyl-2-pentanone together with a carrier therefor.
2. A composition of claim 1 wherein 4-cyclohexyl-4-methyl-2-pentanone is present in an amount sufficient to provide at least about 0.01 mg./cubic meter of air containing the malodor.
3. A composition of claim 1 characterized as a room freshener.
4. A composition of claim 3 characterized by being utilized in the form of an aerosol.
5. A method of treating malodors to alleviate their offensive odors characterized by treating the environment containing the malodor with an effective amount of 4-cyclohexyl-4-methyl-2-pentanone.
6. A method of claim 5 wherein the 4-cyclohexyl-4-methyl-2-pentanone is provided in an amount sufficient to provide at least 0.01 mg./cubic meter of air in the environment containing the malodor.
7. A method of claim 5 characterized wherein 4-cyclohexyl-4-methyl-2-pentanone is utilized in the form of a room freshener.
8. A method of claim 7 characterized wherein the room freshener is introduced as an aerosol.



9. A method as defined in claim 5, 6 or 7, wherein the environment is treated with a composition comprising 4-cyclohexyl-4-methyl-2-pentanone together with a carrier therefor.

